

Claims

We Claim:

1. A method for inhibiting the flow of water in a subterranean formation comprising:
injecting into the subterranean formation a composition comprising:
at least one hardener,
at least one catalyst,
at least one alkali metal silicate, and
water; and
permitting the composition to form silica gel in the subterranean formation
for an effective period of time and of a sufficient gel strength to
inhibit the flow of water in the formation.
2. The method of claim 1 where in the injecting, the hardener comprises at least one dialkyl ester of a dicarboxylic acid.
3. The method of claim 2 where in the injecting, the at least one dialkyl ester of a dicarboxylic acid has alkyl groups independently selected from straight or branched alkyl groups of 1 to 4 carbon atoms, and where the dicarboxylic acid used to make the ester has from 1 to 8 carbon atoms.
4. The method of claim 2 where in the injecting, the at least one dialkyl ester of a dicarboxylic acid is selected from the group consisting of dimethyl succinate, dimethyl glutarate, dimethyl adipate, and mixtures thereof.
5. The method of claim 1 where in the injecting, the catalyst is selected from the group consisting of an alkali metal hydroxide.
6. The method of claim 1 where in the injecting, the alkali metal silicate is sodium silicate.

7. The method of claim 1 where in the injecting, the hardener is added to the composition just before the injecting.

8. The method of claim 1 where in the injecting, the composition comprises from about 0.50 to about 2.50 v/v% hardener, from about 0.01 to about 5.00 wt% catalyst, from about 0.025 to about 10.00 v/v% alkali metal silicate, based on the total composition.

9. A method for inhibiting the flow of water in a subterranean formation comprising:

injecting into the subterranean formation a composition comprising:

about 0.50 to about 2.50 v/v% of at least one hardener

selected from the group consisting of dimethyl succinate, dimethyl glutarate, dimethyl adipate, and mixtures thereof,

about 0.01 to about 5.00 wt% of at least one catalyst

selected from the group consisting of an alkali metal hydroxide,

about 0.025 to about 10.00 v/v% at least one alkali metal silicate, and

water; and

permitting the composition to form silica gel in the subterranean formation for an effective period of time and of a sufficient gel strength to inhibit the flow of water in the formation.

10. The method of claim 9 where in the injecting, the hardener is added to the composition just before the injecting.

11. A composition for inhibiting the flow of water in a subterranean formation by formation of a silica gel, the composition comprising:
 - at least one hardener,
 - at least one catalyst,
 - at least one alkali metal silicate, and
 - water; and
12. The composition of claim 11 where the hardener comprises at least one dialkyl ester of a dicarboxylic acid.
13. The composition of claim 12 where the at least one dialkyl ester of a dicarboxylic acid has alkyl groups independently selected from straight or branched alkyl groups of 1 to 4 carbon atoms, and where the dicarboxylic acid used to make the ester has from 1 to 8 carbon atoms.
14. The composition of claim 12 where the at least one dialkyl ester of a dicarboxylic acid is selected from the group consisting of dimethyl succinate, dimethyl glutarate, dimethyl adipate, and mixtures thereof.
15. The composition of claim 11 where the catalyst is selected from the group consisting of an alkali metal hydroxide.
16. The composition of claim 11 where the alkali metal silicate is sodium silicate.
17. The composition of claim 11 where the composition comprises from about 0.5 to about 2.5 v/v% hardener, from about 0.01 to about 5.0 wt% catalyst, from about 0.025 to about 10.00 v/v% alkali metal silicate, based on the total composition.